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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,946	03/12/2004	Sergey Zhidkov	2557-000209/US	7724

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EXAMINER	
FLORES, LEON	

ART UNIT	PAPER NUMBER
2611	

MAIL DATE	DELIVERY MODE
11/27/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/798,946	ZHIDKOV, SERGEY	
	Examiner	Art Unit	
	Leon Flores	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 September 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-28* is/are allowed.

6)☒ Claim(s) *29-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 29-36 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims (29 & 33) are rejected under 35 U.S.C. 103(a) as being unpatentable over Fertner. (US Patent 6,185,251 B1)

Re claim 29, Fertner discloses a non-recursive carrier filtering device for an apparatus for direct measurement of channel state of a receiver, comprising: a delay

unit which delays a first error by one or more carriers (See fig. 4); and a multiplier unit which multiplies filtering coefficients by a present carrier value and the one or more delayed carrier values and outputs a second error which is a sum of the multiplied values (See fig. 4).

But the reference of Fertner fails to explicitly teach that wherein the filtering coefficients are output by an adaptation unit using a signal corresponding to an inverse number of the squared magnitude of the channel frequency response and the second error signal is used to improve channel state estimation.

However, the reference of Fertner does suggest the teaching of calculating the optimal equalizer coefficients used to compensate for channel impairments. (See col. 13, line 62 – col. 14, line 49, col. 15, line 63 – col. 16, line 8.) Furthermore, one skilled in the art would know that "an inverse number of the squared magnitude of the channel frequency response" corresponds to the best channel response, as taught by Bohnke (US Publication 2002/0060990) in paragraph 43.

Therefore, it would have been obvious to one of ordinary skills in the art to have incorporated this feature into the system of Fertner, in the manner as claimed, for the benefit estimating the optimal coefficients.

Claim 33 is a method claim corresponding to system claim 29. Hence, the elements in system claim 29 would have necessitated the steps performed in method claim 33. Therefore, claim 33 has been analyzed and rejected w/r to claim 29 above.

5. **Claims (30 & 34) are rejected under 35 U.S.C. 103(a) as being unpatentable over Raleigh et al. (hereinafter Raleigh) (US Patent 6,158,041)**

Re claim 30, Raleigh discloses a squared Euclidean distance calculating device for an apparatus for direct measurement of a channel state of a receiver, comprising: a calculating unit which receives a complex signal for a carrier and calculates a squared value of a signal for I (In-phase) and a squared yalue of a signal for Q (Quadrature) of the carrier and outputs an error, wherein the error is used to improve channel state estimation. (See fig. 7 & col. 8, lines 45-58)

But the reference of Raleigh fails to explicitly teach which is a sum of the squared values.

However, the reference of Raleigh does suggest the teachings of a periodic distance vector corresponding to the sum of the squared Euclidean distance. (See col. 5, lines 30-46)

Therefore, it would have been obvious to one of ordinary skills in the art to have incorporated this feature into the system of Raleigh, in the manner as claimed, for the benefit estimating the channel impairments.

Claim 34 is a method claim corresponding to system claim 30. Hence, the elements in system claim 30 would have necessitated the steps performed in method claim 34. Therefore, claim 34 has been analyzed and rejected w/r to claim 30 above.

6. **Claims (31 & 35) are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiou et al. (hereinafter Chiou) (US Publication 2004/0218519 A1), and in view of Fertner. (US Patent 6,185,251 B1)**

Re claim 31, Chiou discloses an adaptation device for an apparatus for direct measurement of a channel state of a receiver, comprising: an estimating unit which estimates a correlation coefficient signal of two or more adjacent carriers using a signal corresponding to an inverse a squared magnitude of the channel frequency response (See paragraph 11 & 19. A channel response is calculated from pilot information. One skilled in the art would know that there are pilot sub-carriers and data sub-carriers. Furthermore, one skilled in the art would know that in order to estimate the channel a correlation between adjacent carrier must be done); and a filter coefficient selection unit which outputs filtering coefficients belonging to a filtering coefficient group selected according to the estimated correlation coefficient signal, wherein the filtering coefficients are used to improve channel state estimation. (See paragraph 19. Correction and equalization is performed based on the channel response.)

But the reference of Chiou fails to specifically disclose that the correlation coefficient signal of two or more adjacent carrier using a signal corresponding to an inverse a squared magnitude of the channel frequency response.However, Fertner does. (See col. 11, lines 21-26, col. 13, line 62 – col. 14, line 48) The reference of Fertner discloses the teaching of calculating the optimal equalizer coefficients used to compensate for channel impairments. Furthermore, one skilled in the art would know that "an inverse number of the squared magnitude of the channel frequency response"

corresponds to the best channel response, as taught by Bohnke (US Publication 2002/0060990) in paragraph 43.

Therefore, taking the combined teachings of Chiou and Fertner as a whole. It would have been obvious to one of ordinary skills in the art to have incorporated this feature into the system of Chiou, in the manner as claimed and as taught by Fertner, for the benefit of estimating the optimal coefficients to compensate for channel impairments.

Claim 35 is a method claim corresponding to system claim 31. Hence, the elements in system claim 31 would have necessitated the steps performed in method claim 35. Therefore, claim 35 has been analyzed and rejected w/r to claim 31 above.

7. **Claims (31 & 35) are rejected under 35 U.S.C. 103(a) as being unpatentable over Fertner. (US Patent 6,185,251 B1)**

Re claim 31, Fertner discloses an adaptation device for an apparatus for direct measurement of a channel state of a receiver, comprising: a filter coefficient selection unit which outputs filtering coefficients belonging to a filtering coefficient group selected according to the estimated correlation coefficient signal, wherein the filtering coefficients are used to improve channel state estimation. (See col. 11, lines 23-26, col. 13, line 64 – col. 14,line 48 & figures 4 & 5)

But the reference of Fertner fails to explicitly teach an estimating unit which estimates a correlation coefficient signal of two or more adjacent carriers using a signal corresponding to an inverse a squared magnitude of the channel frequency

response.However, the reference of Fertner does suggest the teachings of calculating the optimal equalizer coefficients used to compensate for channel impairments. Furthermore, one skilled in the art would know that "an inverse number of the squared magnitude of the channel frequency response" corresponds to the best channel response, as taught by Bohnke (US Publication 2002/0060990) in paragraph 43.

Therefore, it would have been obvious to one of ordinary skills in the art to have incorporated this feature into the system of Fertner, in the manner as claimed, for the benefit estimating the optimal coefficients.

Claim 35 is a method claim corresponding to system claim 31. Hence, the elements in system claim 31 would have necessitated the steps performed in method claim 35. Therefore, claim 35 has been analyzed and rejected w/r to claim 31 above.

8. **Claims (32 & 36) are rejected under 35 U.S.C. 103(a) as being unpatentable over Fertner (US Patent 6,185,251 B1), and in view of Raleigh et al. (hereinafter Raleigh) (US Patent 6,158,041)**

Re claim 32, Fertner discloses an apparatus for direct measurement of a channel state of a receiver, comprising: a non-recursive carrier filtering device including a delay unit which delays the first error by one or more carriers and a multiplier unit which multiplies the filtering coefficients by a present carrier value and the one or more delayed carrier values and outputs a second error which is a sum of the multiplied

values, wherein the second error signal is used to improve channel state estimation. (See fig. 4 & col. 13, line 62 – col. 14, line 49, col. 15, line 63 – col. 16, line 8.)

But the reference of Fertner fails to explicitly teach an adaptation device including an estimating unit which estimates a correlation coefficient signal of two or more adjacent carriers using a signal corresponding to an inverse a squared magnitude of the channel frequency response and a filter coefficient selection unit which outputs filtering coefficients belonging to a filtering coefficient group selected according to the estimated correlation coefficient signal.

However, the reference of Fertner does suggest the teachings of an adaptation device including an estimating unit which estimates a correlation coefficient signal of two or more adjacent carriers using a signal corresponding to an inverse a squared magnitude of the channel frequency response and a filter coefficient selection unit which outputs filtering coefficients belonging to a filtering coefficient group selected according to the estimated correlation coefficient signal. (See col. 11, lines 23-26, col. 13, line 64 – col. 14, line 48 & figures 4 & 5)

Therefore, it would have been obvious to one of ordinary skills in the art to have incorporated this feature into the system of Fertner, in the manner as claimed, for the benefit estimating the optimal coefficients.

The reference of Fertner discloses the limitations as claimed above, except he fails to explicitly teach a squared Euclidean distance calculating device including a calculating unit which receives a complex signal for a carrier and calculates a squared

value of a signal for I (In-phase) and a squared value of a signal for Q (Quadrature) of the carrier and outputs a first error, which is a sum of the squared values.

However, Raleigh does. (See fig. 7 & col. 8, lines 45-58) Raleigh discloses a calculating unit which receives a complex signal for a carrier and calculates a squared value of a signal for I (In-phase) and a squared yalue of a signal for Q (Quadrature) of the carrier and outputs an error, wherein the error is used to improve channel state estimation.

Therefore, taking the combined teachings of Fertner and Raleigh as a whole. It would have been obvious to one of ordinary skills in the art to have incorporated this feature into the system of Fertner, in the manner as claimed and as taught by Raleigh, for the benefit of estimating the channel impairments.

The combination of Fertner and Raleigh discloses the limitations as claimed above, except they fail to explicitly teach which is a sum of the squared values.

However, the reference of Raleigh does suggest the teachings of a periodic distance vector corresponding to the sum of the squared Euclidean distance. (See col. 5, lines 30-46)

Therefore, it would have been obvious to one of ordinary skills in the art to have incorporated this feature into the system of Fertner, as modified by Raleigh, in the manner as claimed, for the benefit estimating the channel impairments.

Claim 36 is a method claim corresponding to system claim 32. Hence, the elements in system claim 32 would have necessitated the steps performed in method claim 36. Therefore, claim 36 has been analyzed and rejected w/r to claim 32 above.

Allowable Subject Matter

1. Claims 1-28 are allowed.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leon Flores whose telephone number is 571-270-1201. The examiner can normally be reached on Mon-Fri 7-5pm Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Payne can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LF
November 3, 2007

DAVID C. PAYNE
SUPERVISORY PATENT EXAMINER